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SECTION 3

AFFECTED ENVIRONMENT

Section 3 provides background information on regional and local planning, the built environment, the human environment with respect to socioeconomic characteristics and trends, and the natural environment in the WIS 83 study area. Information is also provided on agricultural resources, archaeological and historic resources, and public use land. The focus of Section 3 is to establish the context for proposed improvements to WIS 83 and their impacts.

LAND USE AND RELATED CHARACTERISTICS

Geographical Setting

The WIS 83 corridor is located in Waukesha County in southeastern Wisconsin where it passes through the Town of Mukwonago, Town of Genesee, unincorporated Genesee Depot, Village of Wales, Town and City of Delafield, Village of Hartland, Town of Merton, and borders the Village of Chenequa. The topography along WIS 83 includes gently sloping and rolling ground moraine, drumlins, and outwash plains typical of the Kettle Moraine area. Elevations range from 820 feet (250 meters) at National Geodetic Vertical Datum (NGVD) near Saxony Court in Mukwonago, to 1,050 feet (320 meters) near Concord Lane in Delafield.

Land Use Planning

Regional and local land use plans applicable to the WIS 83 corridor study are summarized below.

Regional Land Use Plan for Southeastern Wisconsin: 2020—SEWRPC Planning Report No. 45 (December 1997)

This plan provides a framework for transportation, utility, outdoor recreation, and other public facility/development planning at regional, county, and local levels. It recommends intermediate growth for the region based on compact development and redevelopment in areas that can use existing or expanded municipal sewer and water, where soils are suitable for development, and in areas free from hazards such as erosion and flooding. The plan also seeks to preserve remaining primary environmental corridors and prime agricultural land. The relationship between the regional land use plan and transportation planning for the WIS 83 corridor is discussed in EIS Section 1.

A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin—SEWRPC Planning Report No. 42 (September 1997)

This plan is an integral part of the comprehensive planning for development in southeastern Wisconsin. The plan was developed recognizing that urbanization in the region, combined with agricultural activity, has diminished the remaining undisturbed ecological resources. It identifies a wide variety of resources such as natural areas, critical species habitats, wetlands, environmental corridors, geologic features, and archaeological sites, and makes recommendations for the protection and management of these resources.

A Development Plan for Waukesha County—SEWRPC Community Assistance Planning Report No. 209 (August 1996)

The purpose of this “growth management plan” is to guide Waukesha County, its towns and incorporated municipalities, in joint decision-making regarding development. The plan’s focus is orderly economic development, preservation and enhancement of environmental resources. The plan notes that urban land use in the County increased by about 87 percent between 1963 and 1990 and that about 52 percent of urban land use occurred within planned urban service areas with the balance (48 percent) located outside planned service areas. The plan envisions urban land use will increase about 72 percent under future “buildout” conditions with full development of areas proposed for urban land uses and expected to occur sometime after year 2020. In its transportation recommendations, the Waukesha County development plan notes that the WIS 83 corridor would need to be a 4-lane facility in its entirety to accommodate future buildout development.

Town of Mukwonago Land Use Planning

The WIS 83 corridor study begins at the Town of Mukwonago border with the Village of Mukwonago. In 1998, the town updated its master plan in an effort to guide decision-making for planning, monitoring, and controlling the direction of growth and types of land use in the town. The following planning goals have been identified:

- Maintain and enhance the natural environment.
- Increase recreational development.
- Maintain and provide quality public services.
- Recognize and provide for vehicular, pedestrian, and recreational transportation needs.
- Encourage infill of future residential areas to compliment the rural-residential nature of the community.
- Limit commercial development.
- Prohibit heavy industrial development.
- Support public and institutional uses.
- Preserve agricultural lands.

The plan does not specifically address potential improvement to WIS 83. The land use plan map for the WIS 83 study corridor indicates approximately 90 percent agricultural, 7 percent high density residential, and 3 percent medium density residential land uses.

Town of Genesee Land Use Planning

The Town of Genesee is in the process of developing a land use master plan. The Town’s goals are to preserve the rural character of the area, especially the historic setting of Genesee Depot.

Village of Wales Land Use Planning

The Village of Wales is in the process of developing a land use master plan. The zoning map for the WIS 83 corridor indicates approximately 54 percent residential, 29 percent local business, 8 percent cemetery, and 9 percent institutional zoning.

Town of Delafield Land Use Planning

The Town of Delafield Land Use Plan was adopted in 1999 and is intended to serve as the primary public policy document for guiding future growth and development. The following planning goals have been identified:

- Limit growth and development to the identified districts and policies.
- Protect environmental resources.
- Permit limited residential development.
- Provide for commercial, retail, and office development in select locations.
- Mixed-use development should be included within commercial clusters.
- Light industrial development should be located in areas where an adequate transportation system and infrastructure are available and surrounding uses are compatible.
- Maintain a safe and efficient transportation system.
- Use community and institutional facilities to create social and cultural centers.
- Provide park and recreational areas.
- Allow redevelopment of existing housing stock in the Lake District.

The plan does not specifically address potential improvement to WIS 83. The land use plan map for the WIS 83 study corridor indicates approximately 67 percent residential, 18 percent open space, 12 percent wetlands, and 3 percent institutional land uses.

City of Delafield Land Use Planning

The City of Delafield Comprehensive Plan was updated in 1991 to guide growth and development. The following planning goals have been identified:

- Encourage growth and development in a planned and coordinated manner.
- Encourage development that is compatible with neighboring land uses and preserves the character of existing neighborhoods.
- Encourage new development to locate in areas that can be served by existing and planned streets and public utilities.
- Encourage large ownership parcels to be developed as planned unit developments rather than subdivided into lots without a coordinated development plan.
- Discourage commercial uses in predominantly residential neighborhoods.
- Avoid unplanned commercial strip development at key interchanges and along highway frontages.
- Encourage planned retail commercial development in the Heritage Ridge area so that the area functions as a retail commercial district.
- Continue to promote specialty commercial development in Downtown Delafield (off Genesee Street/County C).
- Maintain downtown as the center for civic, cultural, and government activities.
- Preserve the character of existing single-family neighborhoods and discourage further duplex development.

The plan does not specifically address potential improvement to WIS 83. The plan map for the WIS 83 study corridor indicates approximately 62 percent rural estate, 16 percent parks, 8 percent local and highway business, 8 percent mixed use, 4 percent institutional, 1 percent high density residential, and 1 percent conservancy land uses.

Village of Hartland Land Use Planning

The Village of Hartland is in the process of updating their land use master plan. The map for the WIS 83 corridor found in the Land Use Plan For The Village of Hartland Sanitary Sewer Service Area: 2000, indicates approximately 54 percent business park development, 23 percent manufacturing and wholesale development, and 23 percent primary and secondary environmental corridor land uses.

Town of Merton Land Use Planning

The Town of Merton is in the process of developing their land use master plan.

Zoning

Waukesha County has shoreland and floodplain zoning ordinances regulating development in all unincorporated areas. Shoreland zoning includes land within 1,000 feet (300 meters) of the ordinary high water mark of navigable lakes, ponds, or flowages, and within 300 feet (100 meters) of the ordinary high water mark of navigable rivers and streams. All of the municipalities within the WIS 83 study corridor have zoning ordinances that regulate a number of land use issues.

Transportation Service

Mass Transit

Transit (bus) service, taxis, and para-transit service are not available in the WIS 83 study corridor. There are no plans to extend service to the corridor because land use plans indicate there will not be sufficient ridership density in this portion of Waukesha County to warrant or support viable transit service. Wisconsin Coach Lines that runs in an east-west direction along I-94 does have a stop at the park and ride lot located at WIS 83 and County DR (Golf Road) in Delafield.

Air and Rail Service

One airport is located near the study area. Crites Field, owned by Waukesha County, is located off County J south of I-94 and is about 6 miles (10 km) east of WIS 83. It is a transport/corporate airport serving single-engine aircraft, twin-engine piston and turboprop aircraft, and business and corporate jets. No commercial flight service is provided.

There is an at-grade crossing of the Wisconsin Southern (WS) railroad just west of Longacre Road in Genesee Depot. On average, 2 freight trains per day traveling at 25 mph (40 km/h) use the track. The crossing is protected with warning lights but no gates. The exposure factor at this crossing based on the average number of trains per day multiplied by the Annual Average Daily Traffic on WIS 83 in Design Year 2026 is 24,000. The exposure factor is well below the 100,000 threshold that WisDOT uses for evaluating whether a grade separated crossing is warranted in an urban area.

WIS 83 also passes over the Canadian Pacific (CP) railroad about 0.2 miles (0.3 km) south of Capitol Drive. On average, 30 freight trains per day traveling at 50 mph (80 km/h) use this track. There are also two Amtrak trains per day and the track is potentially slated for a future high speed or commuter rail system. No exposure factor was calculated because the existing crossing is grade separated.

Highways

Information on WIS 83 and other highways in the study area is provided in EIS Section 1. Based on the results of a travel survey using a license plate video technique, the majority of trips in the WIS 83 corridor are short and medium trips.

Residential Development

According to SEWRPC's 2020 Regional Land Use Plan, urban residential development in Waukesha County between 1990 and 2020 is expected to increase by 64 percent for high density, 75 percent for medium density, 6 percent for low density, and 30 percent for suburban density development. Residential development along WIS 83 is expected to continue as the corridor transitions to a suburban/urban setting. Subdivisions adjacent to WIS 83 are summarized in Table 3-1 and illustrated on Exhibit 3-1. Farmhouses and other rural residences that are not located in subdivisions are also scattered throughout the WIS 83 corridor.

TABLE 3-1
Residential Subdivisions Adjacent to WIS 83

Development	Location	Lots/Units	Comments
Saxony Hills	East of WIS 83, between County NN and County I	12 lots	Has direct access to WIS 83
Briarfield Manor	East of WIS 83, between County NN and County I	43 lots	Has direct access to WIS 83
Rolling Knoll Estates	East of WIS 83, between County X and Walnut Street	9 lots	No direct access to WIS 83
McFarlane Manor	East of WIS 83, between County X and Walnut Street	50 lots	Has direct access to WIS 83
Holiday Estates West	East of WIS 83, between County X and Walnut Street	5 lots	Has direct access to WIS 83
Genesee	East and west WIS 83, between Walnut Street and Old Village Road	11 lots	Has direct access to WIS 83
Spring Meadows	North of WIS 83, between WIS 59 and Wisconsin Southern railroad in Genesee Depot	15 lots	Has direct access to WIS 83
Genesee Depot	East and west of WIS 83, between WIS 59 and Johns Way	40 lots	Has direct access to WIS 83
Victoria Pond	East of WIS 83, between Johns Way and County D in Genesee Depot	33 lots	Has direct access to WIS 83
A Bit of Kent	West of WIS 83, between County D and County DE/E	16 lots	Has direct access to WIS 83
Esser Point	West of WIS 83, between County D and County DE/E	80 lots	No direct access to WIS 83
Porthamel	West of WIS 83, between County DE/E and County G in Wales	7 lots	Has direct access to WIS 83
Wales	East and west of WIS 83, between County DE/E and US 18	18 lots	Has direct access to WIS 83
Cambrian Hills	East of WIS 83, between County G and US 18 in Wales	47 lots	Has direct access to WIS 83

TABLE 3-1
Residential Subdivisions Adjacent to WIS 83

Development	Location	Lots/Units	Comments
Genesee Farms	West of WIS 83, between County G and US 18 in Wales	149 lots	Has direct access to WIS 83
Village Glen	West of WIS 83, between County G and US 18 in Wales	19 lots	Has direct access to WIS 83
High Meadow	West of WIS 83, between US 18 and Hillside Drive	58 lots	Has direct access to WIS 83
Genesee Woods	East of WIS 83, between US 18 and Hillside Drive	27 lots	Has direct access to WIS 83
The Hills of Delafield	East of WIS 83, between US 18 and Hillside Drive	71 lots	Has direct access to WIS 83
Hidden Hills Estates	East of WIS 83, between US 18 and Hillside Drive	19 lots	No direct access to WIS 83
Hickory Hills	West of WIS 83, between US 18 and Hillside Drive	8 lots	Has direct access to WIS 83
Twin Oaks	West of WIS 83, between US 18 and Hillside Drive	68 lots	Has direct access to WIS 83
The Meadows	West of WIS 83, between US 18 and Hillside Drive	81 lots	Has direct access to WIS 83
Carlton Ridge	East of WIS 83, between US 18 and Hillside Drive	13 lots	Has direct access to WIS 83
Fairfield Addition	East of WIS 83, between US 18 and Hillside Drive	77 lots	Has direct access to WIS 83
Timber Ridge Estates	West of WIS 83, between US 18 and Hillside Drive	45 lots	Has direct access to WIS 83
Hillside	West of WIS 83, between Hillside Drive and I-94	35 lots	Has direct access to WIS 83
Nagawaukee Heights	West of WIS 83, between County DR and County KE	23 lots	Has direct access to WIS 83
Lakewood Estates	West of WIS 83, between County DR and County KE	15 lots	No direct access to WIS 83
Timber Oak	West of WIS 83, between County DR and County KE	12 lots	No direct access to WIS 83
Country Aire Apartments	East of WIS 83, between County KE and WIS 16	184 units	No direct access to WIS 83
Chapel Ridge	North of WIS 83, between WIS 16 and County K	35 lots	Has direct access to WIS 83

Commercial and Industrial Development

According to SEWRPC's 2020 Regional Land Use Plan, commercial development in Waukesha County between 1990 and 2020 is expected to increase by 43 percent, and industrial development is expected to increase by 82 percent. Business developments adjacent to WIS 83 are summarized in Table 3-2 and illustrated on Exhibit 3-1.

TABLE 3-2
Business Developments Adjacent to WIS 83

Business Developments	Location	Size	Comments
Old Village of Genesee business/commercial area...includes restaurant, automotive repair, and small engine repair	East and west of WIS 83 from Walnut Street to WIS 59	5 acres (2 ha)	Direct access to WIS 83
WIS 59 commercial/business area...includes gas station, bank, convenience store, medical office, and home improvement stores	At WIS 83 and WIS 59 intersection	30 acres (12 ha)	Two access points on WIS 83, one access point on WIS 59
Genesee Depot commercial/business area...includes restaurants, a tavern, Lion's Club, dance studio, grain sales, dentist, and a hair stylist	East-West leg in Genesee Depot	6 acres (2.5 ha)	Direct access to WIS 83
Wales business area...includes gas stations, lawn sales, tree sales, dentist, hair stylist, home improvement, restaurants, bank, Pick n Save grocery complex, automotive repair, and custard stand	Main Street to US 18	30 acres (12 ha)	Direct access to WIS 83
Heritage Ridge Retail Commercial District...major tenants include Wal-Mart, Home Depot, Target, Ace Hardware, Baymont Hotel, Colders Furniture, and Hillside Cinema's	Hillside Drive to I-94	85 acres (34 ha)	Four access points on WIS 83
Golf Road commercial area...major tenants include Kohl's Department Store, Sentry Foods, Walgreen's, Holiday Inn Express, and M&I Bank	I-94 to Golf Road (County DR)	65 acres (26 ha)	Three access points on WIS 83
Hartland Corporate Park	County KE to Walnut Ridge Drive north	205 acres (83 ha)	Three access points on WIS 83
Hartland Industrial Park	Cardinal Lane to Canadian Pacific railroad	165 acres (67 ha)	One access point on WIS 83

Other isolated businesses include an implement dealer on the northwest corner of WIS 83 and County I, a few houses converted to offices, a pottery dealer near County KE, and a daycare center adjacent to the Bark River.

Institutional and Public Services

Exhibit 3-2 shows the locations of community facilities in the WIS 83 study area.

Fire, Ambulance, Police Protection

The Town and Village of Mukwonago have a joint fire department with 2 fire stations. Full-time and volunteer staff totaling approximately 90 people, provide fire and EMT service. A new fire station on County ES is planned for completion by mid 2003.

The Town of Genesee and the Village of Wales have a joint volunteer fire department with 1 fire station. Full-time and volunteer staff totaling approximately 40 people, provide fire and EMT/ambulance services for half of the Town of Genesee and all of the Village of Wales. The North Prairie fire department provides fire and EMT/ambulance services for the other half of the Town of Genesee. The Village of Wales is planning a new fire station on the east side of WIS 83 just north of County DE/E.

The Town of Delafield has a volunteer fire department with 2 fire stations. Full-time and volunteer staff totaling approximately 50 people, provide fire and EMT/ambulance services.

The City of Delafield has a fire department that includes certified paramedics and approximately 40 full-time and volunteer staff providing fire and EMT/ambulance services. The City of Delafield also provides ambulance service to the Village of Nashotah.

The Village of Hartland has a volunteer fire department with 1 fire station. Full-time and volunteer staff totaling approximately 40 people, provide fire and EMT/ambulance services.

The Town of Merton has contracts with 4 fire departments: North Lake, Stone Bank, Village of Merton and Village of Hartland, and 2 rescue squads to provide fire and EMT/ambulance services.

The Waukesha County Sheriff's Department provides police protection for the Village of Wales, the Town of Delafield and the Town of Merton. The Waukesha County Sheriff's Department and the Village of North Prairie Police Department provide police protection for the Town of Genesee. The Town of Mukwonago, Village of Mukwonago, City of Delafield, and Village of Hartland have separate police departments.

Schools / Related

The Mukwonago, Kettle Moraine, and Arrowhead School Districts serve the Waukesha County study area. Magee Elementary School, located on the east side of WIS 83 in Genesee Depot is the only public school adjacent to WIS 83. It is part of the Kettle Moraine School District and has approximately 300 students in kindergarten through 5th grade.

Other schools in the study area include the Kettle Moraine High School and Wales Elementary School adjacent to US 18 near WIS 83, St. Paul's Catholic School and Church on the northwest corner of WIS 83 and County D and the Divine Redeemer Lutheran Church and School on the south side of WIS 83 just west of the WIS 16 interchange.

The Ethan Allen School, located adjacent to Lapham Peak State Park just north of Wales, is a 216-acre (87 ha) Wisconsin Department of Corrections facility that provides treatment and educational curricula for juvenile offenders.

Utilities

Municipal water and sewer service is provided in the City of Delafield and Village of Hartland. Private wells and septic systems serve development in the Towns of Mukwonago, Genesee, Delafield, and Merton, and the Villages of Wales and Chenequa.

The following utilities serve the WIS 83 Corridor:

Electric – We Energies (Electric Operations)

Electric transmission lines – American Transmission Company

Natural gas – We Energies (Gas Operations)

Telephone/ Communications – Ameritech, Century Telephone, Sprint, Touch America

Cable TV – Time Warner Cable

Traffic signals and some lighting – WisDOT

Cemeteries

Exhibit 3-2 shows cemeteries adjacent to WIS 83. The Jerusalem Cemetery is located east of WIS 83 just north of County G. The Salem Cemetery is located on the west side of WIS 83 just north of Brandybrook Road. Additional information is provided in EIS Section 4.

Visual Character/Aesthetics

The visual character and aesthetic quality of an area is created by its composition of landscape features including landforms, streams and other water bodies, wetlands, woodlands, open space such as cropland, historic structures, commercial and residential development, parkland, and other recreational facilities.

The visual character along the WIS 83 corridor from the town of Mukwonago to Genesee Depot is dominated by rolling terrain and geologic landforms typical of the Kettle Moraine area in southeastern Wisconsin. Open space that includes farmland, scattered woodlots, ravines, wetlands, and environmental corridors contribute to a scenic rural setting and several hills provide scenic panoramas of the distant countryside. Notable visual elements in this WIS 83 segment include farmsteads and cropland, residential development at Frog Alley Road, residential development between County X and Holiday Road, the Spring Brook corridor south of Holiday Road, residential and commercial development in the Genesee community, commercial development at the WIS 59 intersection, Carroll College Conservancy land and the Genesee Creek corridor north of WIS 59. Genesee Depot, with its older buildings and tree-lined streets, provides a scenic snapshot of a small rural community that has not changed substantially over time. In general, the visual and aesthetic quality of this portion of the WIS 83 corridor is considered moderate to high.

Between Genesee Depot and Hillside Drive near I-94, the visual character of the WIS 83 corridor is dominated by increased residential development, but still retains some open space, cropland, scattered woodlots and older rural homesteads. Notable visual elements in this WIS 83 segment include the St. Paul Catholic church and school at County D, the Village of Wales Park north of County DE/E, the Jerusalem and Salem cemeteries north of County G, the Glacial Drumlin State Trail south of US 18, commercial development at the US 18 intersection, and the Scuppernon Creek corridor north of US 18. In general the visual and aesthetic quality of this portion of the WIS 83 corridor is considered moderate.

The WIS 83 corridor through the I-94 interchange area (Hillside Drive to County DR/Golf Road) is dominated by commercial development. In general the visual and aesthetic quality of this portion of the WIS 83 corridor is considered low.

The WIS 83 corridor from County DR/Golf Road to WIS 16 is continuing to transition from a suburban to urban setting. While open space has been and will continue to be preserved in the vicinity of wetlands, environmental corridors, parks, a golf course, and green space within residential subdivisions, there is relatively dense residential and commercial development adjacent to WIS 83. Notable visual elements in this WIS 83 segment include the Lake Country Trail, Naga-Waukee County Park and golf course, the Bark River corridor, residential subdivisions and commercial development. In general, the visual and aesthetic quality of this portion of the WIS 83 corridor is considered moderate.

The existing 2-lane highway throughout most of the WIS 83 corridor is a relatively unobtrusive element in the visual environment. It generally follows the rolling terrain without major cut or fill areas to detract from the surrounding visual landscape. The physical dimensions and features of the highway (blacktop driving lanes, gravel shoulders and grass ditches) blend well with the adjacent landscape and foster a sense of rural character.

Additional information is provided in EIS Section 4.

SOCIOECONOMIC CHARACTERISTICS

Population Levels and Trends

Population levels and trends in the study area are summarized in Table 3-3. The population changes from 1990 to 2000 ranged from an increase of 36 percent in the Town of Delafield to a decrease of 3 percent in the Village of Chenequa.

Minority population data for the study area is summarized in Table 3-4. The largest minority groups in the study area include Hispanics, African Americans, and Asians. The largest minority populations are located in the Town of Delafield.

TABLE 3-3
Study Area Population Levels and Trends

Community	1990 Population	2000 Population	Percent Change
Village of Chenequa	601	583	-3.0%
City of Delafield	5,347	6,472	21.0%
Town of Delafield	5,735	7,820	36.4%
Town of Genesee	5,986	7,284	21.7%
Village of Hartland	6,906	7,905	14.5%
Town of Merton	6,430	7,988	24.2%
Town of Mukwonago	5,967	6,868	15.1%
Village of Mukwonago	4,464	6,162	38.0%
Village of Wales	2,471	2,523	2.1%
Waukesha County	304,715	360,767	18.4%

Source: U.S. Department of Commerce: Bureau of the Census.

TABLE 3-4
Minority Population (2000)

Community	Minority Population (actual)	Minority Population (% of Total Population)	Race	Population by Race (% of Total Population)
Village of Chenequa	18	3.1	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	0.86 0.53 0.68 1.02
City of Delafield	204	3.1	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.43 0.78 0.53 0.34
Town of Delafield	556	7.1	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.70 0.85 0.78 3.76
Town of Genesee	220	3.0	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.77 0.63 0.33 0.27
Village of Hartland	251	3.2	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.47 0.70 0.64 0.38
Town of Merton	172	2.2	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.03 0.73 0.24 0.20
Town of Mukwonago	223	3.2	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.44 0.74 0.74 0.29
Village of Mukwonago	200	3.2	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.80 0.38 0.58 0.42
Village of North Prairie	29	1.8	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	1.04 0.36 0.40 0.00
Village of Wales	53	2.1	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	0.92 0.52 0.48 0.17
Waukesha County	20,862	5.8	Hispanic origin Asian or Pacific Islander American Indian or Eskimo African-American	2.64 1.45 0.19 0.71

Source: U.S. Department of Commerce: Bureau of the Census.

Income and Work Force

Table 3-5 summarizes income information for the study area. In 2000, the Village of Chenequa had the highest median household incomes, and the Village of Mukwonago had the lowest. All study area communities had median household incomes above the state's median household income. Employment categories for Waukesha County are provided in Table 3-6. Waukesha County has the highest percentage of its work force in services.

TABLE 3-5
Study Area Income

Community	Approximate Median Household Income (2000)	Community	Approximate Median Household Income (2000)
Village of Chenequa	\$163,400	Town of Mukwonago	\$75,100
City of Delafield	\$61,900	Village of Mukwonago	\$56,200
Town of Delafield	\$98,800	Village of North Prairie	\$67,600
Town of Genesee	\$78,700	Village of Wales	\$75,000
Village of Hartland	\$58,400	Waukesha County	\$62,800
Town of Merton	\$78,900	State of Wisconsin	\$43,800

Source: U.S. Department of Commerce: Bureau of the Census.

TABLE 3-6
Study Area Employment

Employment Category	Waukesha County	
	Approximate Number	Percent
Agriculture	1,580	<1.0
Mining	260	<1.0
Construction	13,100	6.0
Manufacturing	51,600	26.0
Transportation and Public Utilities	12,980	6.0
Wholesale Trade	19,200	9.0
Retail Trade	36,600	18.0
Finance, Insurance, and Real Estate	12,100	6.0
Services	54,200	27.0
Unclassified	80	<1.0
Total	201,680	100

County Data Source: U.S. Department of Commerce, Bureau of Census: 1997 County Business Patterns

Transportation Trends

The mean commuter travel time to work for Waukesha County residents is approximately 22 minutes. Of the Waukesha County residents 16 years or older who are employed, approximately 87 percent commute alone in a car, truck, or van. Approximately 7 percent of the Waukesha County workforce carpooled with at least one other person. The remaining 6 percent of Waukesha County workers used public transportation, walked or bicycled to work or worked at home.

ENVIRONMENTAL AND RELATED RESOURCES

Surface Water and Fishery

Streams and drainageways crossed by WIS 83 are summarized in Table 3-7 and shown on the Aerial Photo Exhibit at the back of the EIS. Genesee Creek and Spring Brook are within the Fox River watershed. The Bark River and Scuppernong Creek are within the Rock River watershed.

Scuppernong Creek, Genesee Creek, and Spring Brook are all cold water communities. WIS 83 crosses Scuppernong Creek near the headwaters of the creek. The Ozark Minnow (a state listed threatened fish) and the Lake Chubsucker (a state listed special concern fish) are known to be potentially present in Scuppernong Creek according to DNR records. The Longear Sunfish (a state listed threatened fish) and the Lake Chubsucker are known to be potentially present in Genesee Creek.

Since the Draft EIS, DNR has provided the following additional information on the cold water communities:

- Scuppernong Creek is not currently classified as a trout stream, but will be on a future trout stream list. It supports a small population of wild brown trout.
- Genesee Creek is a Class I trout stream above WIS 59 and a Class II trout stream below WIS 59.
- Spring Brook is a Class I trout stream.

Class I streams are high quality trout waters having sufficient natural reproduction to sustain populations of wild trout at or near carrying capacity. Class I streams are not stocked. Class II streams may have some natural trout reproduction but not enough to utilize available food and space. Stocking is often done to maintain a desirable sport fishery and there is substantial survival of trout from one year to the next.

The Bark River is classified a warm water sport fish community and an aquatic area of statewide or greater significance. The DNR database lists the following fish species as occurring in Bark River: central mudminnow, northern pike, common carp, white sucker, and fantail darter. Correspondence from DNR indicates the Least Darter (state listed special concern fish), Mottled Darter (state listed special concern fish), Slender Madtom (state listed endangered fish), and Pugnose Shiner (state listed threatened fish) may also be present in the Bark River. The Fox River tributary is also classified as a warm water stream.

TABLE 3-7
Stream / Drainageway Summary

Name (Type)	General Location	Description
Fox River tributary (warm water community)	South of Saxony Court	A 6' high x 4' wide (1.8 meters x 1.2 meters) reinforced concrete box culvert carries WIS 83 over a tributary to the Fox River. The channel is well defined and averages 3 feet (1.0 meters) wide with an average depth of 0.3 feet (0.1 meters). There is wetland vegetation along the creek. The substratum consists of sand and pebbles.
Spring Brook (Class I trout stream)	South of Holiday Road	Twin 54" (1.4 meters) reinforced concrete culvert pipes carry WIS 83 over Spring Brook. The channel is well defined and averages 5 feet (1.5 meters) wide with an average depth of 1 foot (0.3 meter). There is wetland vegetation along the creek. The substratum consists of sand and pebbles.
Genesee Creek west branch (cold water community)	South of Genesee Depot	A 7' high x 6' wide (2.1 meters x 1.8 meters) reinforced concrete box culvert carries WIS 83 over Genesee Creek. The channel is well defined and averages 5 feet (1.5 meters) wide with an average depth of 1.5 feet (0.5 meters). There is wetland vegetation along the creek. The substratum consists of sand and pebbles.
Genesee Creek west and north branches (Class I trout stream above WIS 59 and Class II trout stream below WIS 59)	WIS 59, east of WIS 83	A single span concrete girder bridge carries WIS 83 over Genesee Creek, a permanent flow stream. The channel is well defined and averages 8 to 15 feet (2 to 5 meters) wide, with an average depth of 0.5 feet (0.2 meter). There is wetland vegetation along the creek on both sides of WIS 83. The substratum consists of sand and pebbles.
Scuppernong Creek (cold water community not presently classified; DNR plans to list as trout stream in the future)	Adjacent to Mary Court	A 6' (1.8 meter) diameter reinforced concrete culvert pipe carries WIS 83 over the Scuppernong Creek, a permanent flow stream. The channel is well defined and averages 5 feet (1.5 meters) wide with an average depth of 0.5 feet (0.2 meters). There is wetland vegetation along the creek. The substratum consists of sand and pebbles.
Bark River (warm water community)	Midway between Cardinal Lane and Walnut Ridge Drive	A single span concrete girder bridge carries WIS 83 over the Bark River, a permanent flow stream. The channel is well defined and averages 10 to 20 feet (3 to 6 meters) wide, with an average depth of 1 to 2 feet (0.3 to 0.6 meters). There is wetland vegetation along the river on both sides of WIS 83. The substratum consists of sand and pebbles. The bridge was constructed in 1993 and has provisions for an 8-foot (2.4 meter) trail on the north side with an 8-foot (2.4 meter) vertical clearance. An existing 0.65 acre (0.26 ha) wetland mitigation site is located on the east side of WIS 83 and just south of the Bark River.

Water Quality

The cold water communities and warm water sport fish community designations discussed above are “biological use objectives” that are used by DNR as water quality indicators. The cold water communities are capable of supporting a cold water fishery (including trout species) and other aquatic life or serving as a spawning area for cold water species. The warm water sport fish communities are considered suitable for the protection and propagation of a balanced fish and other aquatic life community as described in the Federal Water Pollution Control Act Amendment of 1972 (*Waukesha County Land and Water Resource Management Plan, 1999–2002*).

The water quality parameters and standards for cold water communities are found in Table 3-8, and standards for warm water sport and forage fish communities are found in Table 3-9.

TABLE 3-8
Water Quality Parameters and Standards for Cold Water Communities

Water Quality Parameters	Standards
Temperature (°F)	background
Dissolved Oxygen (mg/L)	6.0 minimum ¹
pH Range (SU)	6.0–9.0
Total Phosphorus (mg/L)	0.1 maximum in streams ² 0.02 maximum in lakes ³
Non-ionized Ammonia Nitrogen (mg/L)	0.02 maximum
Chloride (mg/L)	1,000 maximum
Fecal Coliform (Counts per 100 milliliters)	200 maximum
Notes: 1. 7.0 mg/L minimum during spawning season. 2. In streams classified for full recreational use. 3. During spring, in lakes classified for full recreational use.	

TABLE 3-9
**Water Quality Parameters and Standards for Warm Water
Sport and Forage Fish Communities**

Water Quality Parameters	Standards
Temperature (°F)	89.0 maximum
Dissolved Oxygen (mg/L)	5.0 minimum
pH Range (SU)	6.0–9.0
Total Phosphorus (mg/L)	0.1 maximum in streams ¹ 0.02 maximum in lakes ²
Non-ionized Ammonia Nitrogen (mg/L)	0.04 maximum
Chloride (mg/L)	1,000 maximum
Fecal Coliform (Counts per 100 milliliters)	200 maximum
Notes: 1. In streams classified for full recreational use. 2. During spring, in lakes classified for full recreational use.	

Environmental Corridors and Natural Areas

Environmental Corridors

As defined by SEWRPC, environmental corridors are linear areas in the landscape containing high value natural, scenic, historic, scientific, and recreational features. In southeastern Wisconsin, environmental corridors generally lie along streams, lakes, upland ravines, and other topographic features in the Kettle Moraine area. Natural resources found in environmental corridors include streams/shoreland, wetlands, woodlands, prairies, wildlife habitat, poorly drained and organic soils, and rugged terrain. Primary environmental corridors are a minimum of 400 acres (162 ha) in size, 2 miles (3.2 km) long and 200 feet (61 meters) wide. Secondary environmental corridors connect with the primary corridors and are smaller in size.

The four locations where primary environmental corridors are crossed within the WIS 83 study area are shown on Exhibits 2-4, 2-5, and 2-6. Primary environmental corridors are associated with Spring Brook, Genesee Creek and its tributaries, Scuppernong Creek, and the Bark River. There are no secondary environmental corridors in the WIS 83 corridor.

Natural Areas

As defined by SEWRPC, natural areas include tracts of land or water so little modified by human activities that they contain intact native plant and animal communities believed to be representative of the presettlement landscape.

Natural areas are classified further into designated State Natural Areas, those of statewide or greater significance, those of countywide or regional significance, and those of local significance. Classification is based on the diversity of plant and animal species, community types present, and the structure and integrity of native species. Locations of natural areas in the general WIS 83 study area are illustrated in Exhibit 3-3 and summarized in Table 3-10.

It should be noted that the only Natural Area within the area of potential effect for the WIS 83 project is the Carroll College Conservancy. No fen communities are within the area of potential effect.

TABLE 3-10
Natural Areas Summary

Name	Location	Description/Comments
1. Vernon Fen ¹	Town of Mukwonago	Countywide importance; Good-quality calcareous fen and springs that are recovering from past disturbance. Two State-designated threatened plant species, false asphodel (<u>Tofieldia glutinosa</u>), and beaked spike-rush (<u>Eleocharis rostellata</u>), occur here.
2. Vernon Prairie-Fen ¹	Town of Mukwonago	Countywide importance; Good-quality wet prairie, calcareous fen, and shrub-carr complex that has been affected by adjacent ditching. Contains beaked spike-rush (<u>Eleocharis rostellata</u>), a State-designated threatened species.
3. Vernon Tamarack-Fen ¹	Town of Mukwonago	Countywide importance; Good-quality calcareous fen with medium-aged tamaracks. A number of uncommon species are present, including the State-designated threatened white lady's-slipper orchid (<u>Cypripedium candidum</u>)
4. Spring Lake Sedge Meadow & Fens ¹	Town of Mukwonago	Countywide importance; Good-quality sedge meadow with areas of calcareous fen bordering Spring Lake. North half of lake is undeveloped; south half has residences.
5. Genesee Oak Opening & Yatzeck's Fen State Natural Area ¹	Town of Genesee	Statewide importance; Classic bur oak opening on rolling interlobate morainal topography. Numerous small openings occur throughout, containing high-quality dry to dry-mesic prairies with side-oats grama, big blue-stem, little bluestem, Indian grass, pasqueflower, prairie smoke, leadplant, and silky aster. Lowlands to east contain mesic and wet-mesic prairie, while to the south Yatzeck's Fen offers a series of high-quality springs and excellent fen.
6. Carroll College Conservancy	Town of Genesee	Local importance; Genesee Creek flood plain-wetland complex and consists of second growth, Southern wet to wet-mesic lowland hardwoods; privately owned.
7. CTH D Railroad Prairie ¹	Town of Genesee	Local importance; Patchy, moderate-quality dry-mesic prairie remnants along a one-half-mile-long stretch of railway right-of-way.
8. Lapham Peak Woods ¹	Town of Delafield	Local importance; Extensive but isolated xeric oak woods on rough interlobate moraine, dominated by white, red, and bur oaks, shagbark hickory, and black cherry. There is a past history of grazing and selective cutting. Threatened by encroaching subdivisions. Contains the late coralroot orchid (<u>Corallorhiza odontorhiza</u>), a State-designated special concern species.
9. Pewaukee Lake Access Fen ¹	Town of Delafield	Countywide importance; Good-quality calcareous fen on west side of Pewaukee Lake. Contains regionally uncommon plant species, including a good population of the State-designated threatened beaked spike-rush (<u>Eleocharis rostellata</u>). Site has improved with program of periodic burning.
10. Nagawicka Lake Bog & Oak Woods ¹	City of Delafield	Countywide importance; High-quality tamarack bog at north end of Nagawicka Lake. Relict species include pitcher plant, sundew, bogbean, moccasin-flower orchid, and starflower. Area includes good-quality dry-mesic hardwoods north of bog.
11. Bark River School Sedge Meadow ¹	City of Delafield	Local importance; Small sedge meadow of moderate quality on north side of Bark River.
12. Hartland Railroad Prairie ¹	Village of Hartland	Local importance; Remnant mesic prairie, mostly on hill on north side of railway right-of-way. Characteristic species include big bluestem, rough blazing star, and prairie dock. Threatened by residential development.
Notes:		
1. Indicated resources are outside the area of potential effect for the reasonable Build Alternatives being considered in the WIS 83 corridor.		

Floodplains

Stream crossings along WIS 83 with designated 100-year floodplains that provide several ecosystem functions include Spring Brook, Genesee Creek, Scuppernong Creek, and the Bark River. Floodplains provide flood and storm water attenuation by decreasing water velocities and temporarily storing flood water thus also removing nutrients and providing erosion control. Floodplain areas also serve as wildlife movement corridors and provide wildlife habitat. These functions vary among locations depending on vegetative cover, stream hydrology, and distance from the stream.

Groundwater and Water Supply

Water supply in the study area comes from groundwater in three aquifers: the sand and gravel glacial drift aquifer (shallow system), the dolomite aquifer (shallow system), and the sandstone aquifer (deep artesian system). The depth of the aquifers varies throughout the study area. Private residential wells draw water from the sand/gravel and dolomite aquifers, and the public water systems draw water from the deeper artesian aquifer. Groundwater quality in Waukesha is good, and suitable for most uses. However, most of the water is very hard and requires softening for some uses.

Public water supply facilities along the WIS 83 corridor include those in the Village of Mukwonago, City of Delafield, and Village of Hartland. The high capacity wells in Mukwonago range from 105-1,500 feet (32-457 meters) deep. The municipal well in the City of Delafield is 1,215 feet (370 meters) deep, and the Village of Hartland wells range from 82-125 feet (25-38 meters) deep. The private high capacity well serving the Ethan Allen School in Wales is 1,240 feet (378 meters) deep, and the well serving the Magee Elementary School in Genesee Depot is 815 feet deep. There are no sole source aquifers in the project area as stipulated in Section 142(e) of the Safe Drinking Water Act.

Water supply along the majority of the WIS 83 corridor is provided by private wells. Information on well depth was obtained from well construction logs maintained by the Wisconsin Geologic and Natural History Survey in Madison. Representative well depth information adjacent to WIS 83 is summarized in Table 3-11. This information is representative of wells immediately adjacent to WIS 83 or within the same quarter section through which the highway passes.

TABLE 3-11
Domestic Water Supply Well Depths

Community and Highway Segment	Well Depth Range	Number of Sample Well Reports	Average Well Depth
Town of Mukwonago County NN—Frog Allen Road Frog Alley Road—County I County I—County X	30-75 feet (9-23 meters) 35-120 feet (11-36 meters) 43-65 feet (13-20 meters)	10 20 3	56 feet (17 meters) 76 feet (23 meters) 51 feet (15 meters)
Town of Geneseo County X—Holiday Road Holiday Road—WIS 59 WIS 59—County D County D—County DE/E County DE/E—County G County G—US 18	100-185 feet (30-56 meters) 19-61 feet (6-18 meters) 18-45 feet (5-14 meters) 20-82 feet (6-25 meters) 20-66 feet (6-20 meters) 21-86 feet (6-26 meters)	4 8 12 15 12 12	124 feet (38 meters) 47 feet (14 meters) 29 feet (9 meters) 52 feet (16 meters) 37 feet (11 meters) 43 feet (13 meters)
Town of Delafield US 18—I-94	64-148 feet (19-45 meters)	16	112 feet (34 meters)
City of Delafield Village of Hartland I-94—County KE County KE—WIS 16	40-106 feet (12-32 meters) 15-27 feet (5-8 meters)	7 3	71 feet (22 meters) 20 feet (6 meters)

Wetlands

According to the interagency *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1989), wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands perform several important biological functions. These include sediment retention and nutrient removal, water quality protection, wildlife habitat for common as well as threatened, endangered, and special concern species, linear wildlife movement corridors, and ecosystem biodiversity. Wetlands also provide shoreline protection, flood/storm water attenuation, groundwater recharge, and discharge. A particular wetland may provide one or more of these functions depending on factors such as landscape position, plant community composition, and hydrologic regime.

Wetlands along WIS 83 were field delineated and inventoried by SEWRPC. The wetlands are summarized in Exhibit 3-4 and the locations are shown on the Aerial Photo Exhibit at the back of the EIS. Affected wetlands range in size from 0.2 acre (0.1 ha) to 1000 acres (405 ha), and are combinations of riparian wetland (RPE), wet meadow (M), shallow marsh (SM), shrub-scrub (SS), and wooded swamp (WS). These classifications are based on WisDOT's *Interagency Wetland Mitigation Banking Technical Guidelines*. Review of wetland maps from the USDA Natural Resources Conservation Service indicated that designated farmed wetlands are located in the general WIS 83 study area but not within the area of potential effect of the Build Alternatives.

An existing 0.65 acre (0.26 ha) wetland mitigation site is located on the east side of WIS 83 and just south of the Bark River and includes a 0.53 acre (0.21 ha) open water pond. The site was established as part of a 1992 WIS 83 reconditioning project.

The U.S. Environmental Protection Agency (USEPA) in cooperation with the U.S. Army Corps of Engineers has implemented an Advance Identification Program (ADID) to identify wetlands and other waters that are generally suitable or not suitable for discharge of dredged or fill material. In southeastern Wisconsin, advanced identification of such wetlands was undertaken in consultation with SEWRPC and DNR to support objectives of the areawide water quality management plan that seeks to preserve high value aquatic areas by redirecting development outside primary environmental corridors. The discharge of dredged or fill material into wetlands and other waters located in primary environmental corridors is generally considered not in conformance with the Clean Water Act's Section 404 (b)(1) guidelines. Wetlands along the WIS 83 corridor that are located in primary environmental corridors and thus covered by the ADID planning process are noted in Exhibit 3-4.

Upland Habitat

Upland habitat occurs primarily within the remaining primary environmental corridors, isolated natural areas, and other tracts of land that have forested or grassland cover. Land in agricultural use that includes forested edges, open fields, and fencerows also provides important wildlife habitat.

In Waukesha County, the predominant forested uplands are classified as oak forest and oak savannah. Oak forest communities include dry and dry-mesic woods dominated by white, red, black, bur, and Hill's oak. Other species include shagbark hickory and a dense understory of prickly ash, hawthorn, bramble, and dogwood. Oak savannah communities are dominated by scattered bur, white, or black oak over prairie forbs and grasses.

Wildlife

Wetland and upland communities in the study area provide habitat for a variety of mammals, songbirds, waterfowl, raptors, amphibians, and reptiles. Common mammals found in upland habitats include white-tailed deer, opossum, shrews, gray and red squirrels, red fox, raccoon, striped skunk, cottontail rabbit, coyote, woodchucks, mice, gophers, chipmunks, and weasels. Common bird species include the red-tailed hawk, American goldfinch, bobolink, pheasant, wild turkey, sparrows, owls, wrens, thrushes, warblers, hawks, woodpeckers, and vireos. Common reptiles include the brown snake, garter snake, eastern milk snake, and turtles.

Common mammals found primarily in wetland habitats include muskrat, mink, otters, and beaver. Common bird species include red-winged blackbird, long-billed marsh wren, swamp sparrow, sandpipers, wood ducks, herons, egrets, teals, shovelers, wigeons, scaup, bitterns, geese, plovers, terns, mergansers, hawks, and owls. Common reptiles and amphibians include the American toad, leopard frog, and snapping turtle.

SEWRPC's *Regional Habitat Protection and Management Plan* provides information on critical species habitat—areas that support endangered, threatened, special concern, rare or regionally uncommon species. Wetlands in Waukesha County provide habitat for the spotted salamander, an uncommon species.

Threatened and Endangered Species

State Listed Species¹

The DNR has identified several plants, fish, and other threatened, endangered or special concern species that could potentially be present in the WIS 83 study area (see Appendix C, page C-4).

Additional coordination with the DNR Bureau of Endangered Resources since the Draft EIS indicates the following threatened, endangered, or special concern species are likely to be present in the area of potential effect for the preferred alternative (see Appendix D, page D-17):

- Wetland/stream crossings along WIS 83 corridor – Blanding's turtle (threatened), Butler's Garter Snake (threatened). The Pickerel Frog and Bullfrog (special concern) are not likely to be impacted if their habitat is avoided.
- Genesee Creek – Longear Sunfish (threatened), Lake Chubsucker (special concern).
- Scuppernong Creek – Ozark Minnow (threatened), Lake Chubsucker (special concern).
- Bark River – Least Darter (special concern), Slender Madtom (endangered), Mottled Darter (special concern), Pugnose Shiner (threatened).

The DNR Bureau of Endangered Resources also provided the following information:

- There are no threatened, endangered, or special concern plant species known to occur in the project area and no additional surveys are necessary at this time.
- The moths and butterfly species listed in the initial DNR letter (Appendix C, page C-4) are associated with wetland plants and impacts to these would likely be associated with the wetland impacts. No additional surveys are necessary at this time.
- A primary concern is the possible spread of invasive species along the corridor during construction, particularly purple loosestrife that occurs in some of the wetlands and streams. Measures will need to be implemented to ensure that construction equipment does not transport this or other invasive species.

The results of the herptile assessment (for the Blanding's Turtle and Butler's Garter Snake) requested by DNR are provided in EIS Section 4.

Federally Listed Species

The U.S. Fish and Wildlife Service provided information on federally listed threatened or endangered species. The eastern prairie fringed orchid, a threatened species, occurs in Waukesha County. However, the Fish and Wildlife Service indicates widening WIS 83 on its present alignment would not affect this species.

¹ The Wisconsin DNR defines endangered species as those in danger of becoming extirpated; threatened species as those likely to become endangered in the foreseeable future; and special concern species as those about which some problem in abundance or distribution is suspected but not yet proven.

Other Protected Species

The Migratory Bird Treaty Act of 1918 states that unless permitted by regulation, it is unlawful to kill or capture migratory birds or destroy their eggs and nests. This law protects barn swallows that commonly nest under bridges. There are barn swallow nests under the WIS 59 and Bark River structures along the WIS 83 corridor. Additional information is provided in EIS Section 4.

Agricultural Resources

Based on information from the Wisconsin Agricultural Statistics Service administered by the U.S. Department of Agriculture, Waukesha County had 105,600 acres (42,750 ha) in farmland in 1997, a decrease of 8 percent since 1992. The average farm size was 168 acres (415 ha) in 1997, an increase of 2 percent since 1992. Farm production in both counties includes corn, oats, barley, winter wheat, alfalfa hay, soybeans, green peas, and sweet corn. Ginseng and pheasants are specialty products grown by a few farms in each county. Livestock production includes cattle, milk cows, and hogs.

Agricultural land is classified based on farm size and soil type. Generally, prime agricultural land includes farms over 35 acres (14 ha) in size and that have at least 50 percent of their land in soil classes I, II, or III (USDA criteria). Transitional agricultural land is located within urban service areas planned for conversion to urban use within a 10 to 20-year period. According to SEWRPC's Development Plan for Waukesha County, the majority of agricultural land adjacent to the WIS 83 corridor is classified for transition to other uses.

NOISE

Noise is defined as unwanted sound. The sounds generated by vehicular traffic, rail traffic and residential and commercial development in the study area constitute noise to people, and can interrupt normal activities when they reach a certain level. Areas that would likely be sensitive to noise include residential developments, recreational areas, schools, churches and cemeteries. Commercial and industrial land uses would generally be less sensitive to noise.

Sound levels are measured in units called decibels. Since the human ear does not respond equally to all frequencies (or pitches), measured sound levels are often adjusted or weighted to correspond to the frequency response of human hearing and perception of loudness. The weighted sound level is expressed in units called A-weighted decibels (dBA) and is measured with a calibrated sound level meter. Table 3-12 provides an illustration of typical sound levels in dBA. Sound levels are also expressed with the descriptor L_{eq} defined as the equivalent steady-state sound level that in a stated period of time contains the same acoustical energy as the time-varying sound level during the same period.

TABLE 3-12
Typical Sound Levels

Sound Source	Sound Level	Subjective Response
Military Jet Takeoff with after-burner at 50'	130 dBA	
Rock and Roll Band	120 dBA	Uncomfortably Loud
Jet Fly-Over at 1,000'	110 dBA	
Power Lawn Mower at Operator	100 dBA	Very Loud
Diesel Truck (55 mph) at 50'	90 dBA	
High Urban Ambient Sound; Automobile (55 mph) at 50'	80 dBA	Moderately Loud
TV-Audio, Vacuum Cleaner	70 dBA	
Normal Conversation at 4' to 6'	60 dBA	
	50 dBA	Quiet
Lower Limit Urban Ambient Sound	40 dBA	
	30 dBA	Very Quiet
Unoccupied Broadcast Studio	20 dBA	
	10 dBA	
	0 dBA	Threshold of Hearing

Sources: *Noise Assessment Guidelines* Technical Background, HUD Report No. TE/NA 172; *Handbook of Noise Control*, C. M. Harris, 1979; FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, 1978.

A more detailed discussion of the existing and future sound levels related to traffic, noise impacts, possible mitigation measures, and construction related noise impacts is found in EIS Section 4.

AIR QUALITY

Air pollution is the contamination of the atmosphere with gases or particulate matter that are harmful to the human environment. The USEPA, through the 1970 Clean Air Act, has established National Ambient Air Quality Standards (NAAQS) for seven Criteria Air Pollutants. The criteria air pollutants are regulated by USEPA on the basis of information on health and environmental effects. The seven pollutants are ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide inhalable particulate matter, hydrocarbons, and airborne lead. The 1977 and 1990 Clean Air Act Amendments reinforced attainment and maintenance of these standards.

These standards have been adopted by the State of Wisconsin through Wisconsin Administrative Code Chapter NR 404. Air quality standards are definitions of the characteristics of ambient air quality that in terms of present day knowledge, need to be maintained in order to protect the public health and welfare and our environment from adverse effects of air pollution. The goal of the air quality regulations is to ensure that various levels of pollutants do not exceed set standards, and where pollution levels are presently less than standards, to prevent the substantial deterioration of the ambient air quality.

The proposed WIS 83 project is located in the Southeastern Wisconsin Intrastate Air Quality Control Region as designated under Wisconsin Administrative Code Chapter NR 404. According to the USEPA, Waukesha County is a severe non-attainment area for ozone standards. Additional information is provided in EIS Section 4.

HAZARDOUS MATERIALS

A Phase 1 hazardous material screening inventory was done within the area of potential effect along the WIS 83 project corridor. The purpose was to review past land use, identify apparent sources of hazardous materials, and assess the potential for affecting sites that may contain environmental contaminants. The results are discussed in EIS Section 4.

SOIL AND MINERAL RESOURCES

Soils in Waukesha County were formed through glaciation and tend to be dry. The WIS 83 corridor lies mostly within the Fox-Casco association, Rodman-Casco association, Hochheim-Theresa association, and in parts of the Montgomery-Martinson-Saylesville-association, Pella association and Houghton-Palms-Adrian association. These soil associations have the following characteristics:

- *Fox-Casco* – well drained upland soils that have a subsoil of clay loam; moderately deep to shallow over sand and gravel, on outwash plains and stream terraces
- *Rodman-Casco* – excessively drained to well drained upland soils that have a subsoil of gravelly sandy loam and clay loam; shallow over gravel and sand, on the Kettle Moraine
- *Hochheim-Theresa association* – well drained upland soils that are formed in thin loess and loam glacial till, on ground moraines
- *Montgomery-Martinson-Hebron-Saylesville association* – poorly drained to well drained soils that have a subsoil of clay to clay loam; formed in silty clay or silty clay loam sediments, in old lakebeds
- *Pella association* – poorly drained and well drained soils that have a subsoil of silty clay loam or clay loam; moderately shallow over dolomite bedrock
- *Houghton-Palms-Adrian association* – very poorly drained organic soils in depressions on old lakebeds and on flood plains

Other isolated soil types are also present in the WIS 83 corridor. The soils classified as poor in terms of drainage or construction suitability are listed as follows along with their general locations:

- *Adrian muck* – Genesee Creek
- *Brookston silt loam* – south of Genesee Depot, Genesee Creek, Off-Alignment Alternative D
- *Drummer silt loam* – south of County I
- *Houghton muck* – Bark River wetlands
- *Lawson silt loam* – Scuppernong Creek wetlands
- *Martinton silt loam* – near WIS 59, Spring Brook
- *Ogden muck* – Spring Brook wetlands
- *Pella silt loam* – Spring Brook, Off-Alignment Alternative D
- *Pistakee silt loam* – north of Sugden Road, north of Scuppernong Creek
- *Sebewa silt loam* – south of Sugden Road

Mineral resource extraction (sand, gravel, stone) and aggregate production is a prominent industry in Waukesha County. SEWRPC's Development Plan for Waukesha County reports that about 7,200 acres (2,915 ha), or 2 percent of the total land in Waukesha County, is used for mineral extraction. Quarries in the WIS 83 study area are located southwest of Genesee Depot along Grush Road, near US 18 and County C, and at WIS 83 and Capitol Drive.

CULTURAL RESOURCES

Archaeological / Cemeteries

Archaeological investigations along the WIS 83 corridor were conducted by Archaeological Research, Inc. The Phase 1 investigation (identification) included an extensive literature search of published reports, site forms, and reports on previously recorded sites on file at the State Historical Society of Wisconsin. The investigation also included pedestrian field survey, surface collection, and shovel tests as needed to verify presence or absence of archaeological materials in the area of potential effect of the Build Alternatives for the WIS 83 corridor study.

The following sites were identified within the area of potential effect. Additional information is provided in EIS Section 4, Environmental Consequences.

- A prehistoric archaeological site adjacent to an unnamed tributary to the Fox River, east and west sides of WIS 83.
- Genesee Woolen Mill site at the south end of Genesee Depot.
- Jerusalem Cemetery on the east side of WIS 83 and south of Brandybrook Road.
- Salem Cemetery on the west side of WIS 83 and north of Brandybrook Road.

Historic Sites

Investigations for historic properties were conducted by Heritage Research, Ltd. The purpose was to identify possible historically significant structures within the area of potential effect of the Build Alternatives for the WIS 83 corridor study. Structures are historically significant if they meet criteria for eligibility to the National Register of Historic Places. Eligibility criteria for structures are summarized as follows:

- Criterion A—Structures associated with events that have made a significant contribution to broad patterns of our history.
- Criterion B—Structures associated with the lives of persons significant in our past.
- Criterion C—Structures that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

Twenty-five properties along the WIS 83 corridor were evaluated for possible historic importance. Ten were found to warrant determinations of eligibility to the National Register of Historic Places. These include:

- Andrews Farmstead, near an unnamed tributary to the Fox River, west side of WIS 83.
- Niver Farmstead, north of Sugden Road, east side of WIS 83.
- Roe Farmstead, southeastern quadrant of the WIS 83 and Seville Lane/Walnut Street intersection.
- Haugen Farmstead, northeastern quadrant of the WIS 83 and Seville Lane/Walnut Street intersection.
- Genesee Woolen Mill Site, south end of Genesee Depot.

- Union House, north side of WIS 83 and just west of the Wisconsin Southern Railroad in Genesee Depot.
- Genesee Apostolic Church (former St. Paul's Catholic Church), east side of WIS 83 and north of Depot Street in Genesee Depot.
- Magee/Oliver Property, east side of WIS 83 and north of John's Way in Genesee Depot.
- Stone Manor, west side of Brookhill Road and north of WIS 59.
- Albert Campbell Property, north farmstead, west side of WIS 83 and north of Walnut Ridge Drive (north).

In addition, two properties are already listed on the National Register of Historic Places:

- Genesee Town Hall (Lion's Club), north side of WIS 83 and west of the Wisconsin Southern Railroad in Genesee Depot.
- Ten Chimneys, west of Genesee Depot off Depot Road. This property has also been listed as a National Historic Landmark.

The results of the eligibility determinations and information about potential impacts are found in EIS Section 4.

RECREATIONAL RESOURCES / PUBLIC USE LANDS

Recreational resources and public use lands in the general WIS 83 study area are shown in Exhibit 3-3, and summarized in Table 3-13. Additional information on applicable resources relative to the WIS 83 Build Alternatives and the preferred alternative is provided in EIS Sections 4 and 5.

TABLE 3-13
Recreational Resources / Public Use Lands

Name	General Location	Description/Comments
1. Vernon Marsh Wildlife Area	East of WIS 83, south of County I	4,596 acres (1,861 ha) in size along and near the Fox River flood plain, wetlands, and woodlands; includes primary environmental corridor, suitable for hiking and hunting, owned/leased and administered by DNR.
2. Spring Creek Parkway	West of WIS 83, north of County X	22 acres (9 ha) of easement along Spring Brook floodplain, wetlands; primary environmental corridor, undeveloped, land privately owned, easement administered by Waukesha County.
3. Lunt-Fontanne Nature Center ¹	Along Depot Road west of Genesee Depot	17 acres (7 ha) in size; hiking, parking lot, wooded; owned and administered by Town of Genesee.
4. Genesee Park ¹	Intersection of Depot Road and Highview Road	25 acres (10 ha) in size; playfields, ball diamonds and soccer fields; owned and administered by Town of Genesee.
5. Wales Community Park	East of WIS 83, south of Brandybrook Road	80 acres (32 ha) in size; open space/habitat preservation, playfields and soccer fields; owned and administered by Village of Wales.
6. Glacial Drumlin State Trail	Grade separation crossing of WIS 83 south of US 18	47 miles (75 km) in length, former railroad corridor, connects the City of Waukesha with Cottage Grove near Madison; provides for hiking and bicycling, access provided to WIS 83 near US 18; owned and administered by DNR.
7. Scuppernong Creek Parkway	West of WIS 83, north of US 18	Three separate parcels totaling 44 acres (18 ha) along and near Scuppernong Creek flood plain, wetlands, woodlands, and open space; primary environmental corridor, undeveloped; two parcels owned and administered by Waukesha County, one parcel on private land with easement administered by Waukesha County.
8. Lapham Peak State Park ¹	Along County C, south of I-94	1,022 acres (414 ha) in size; includes primary environmental corridor, trails, picnic facilities, shelters; future plans call for camping facilities; along the Ice Age recreation corridor; owned and administered by DNR.
9. Lake Country Trail	Crosses WIS 83 at-grade north of County DR/Golf Road	9 miles (14 km) in length, connects the City of Waukesha with the Town of Summit north of I-94; provides for hiking and bicycling, partially along the Ice Age recreation corridor; owned and administered by Waukesha County.
10. Naga-Waukee County Park and Golf Course	East and west of WIS 83, north of I-94.	416 acres (168 ha) in size; includes swimming, camping, picnic area, playfields, trails, boat launches for both Pewaukee and Nagawicka Lakes and an 18-hole regulation golf course; along the Ice Age recreation corridor; owned and administered by Waukesha County.
11. Ice Age Trail	Crosses WIS 83 at-grade at Mariner Drive	Designated National Scenic Trail and is Wisconsin's only State Scenic Trail; owned and administered by the Ice Age Park and Trail Foundation in cooperation with the National Park Service and DNR; runs informally (no WisDOT permits have been granted or applied for) along WIS 83 from Mariner Drive to County KE. Future Ice Age Trail plans are to cross WIS 83 concurrently with the Lake Country Trail. The Ice Age Trail would then run about ¼ mile (0.4 km) east of WIS 83 along the Naga-Waukee Park and Golf Course and then be on easement to County KE.
12. Ice Age Park & Trail Foundation property	East of WIS 83, south of WIS 16	80 acres (32 ha) in size along and near the Bark River flood plain, wetlands, and woodlands; primary environmental corridor, includes hiking trails (about 3,000 feet/914 meters east of WIS 83); owned by the Ice Age Park and Trail Foundation and administered in cooperation with the DNR.
Notes:		
1. Indicated resources are outside the area of potential effect for the reasonable Build Alternatives being considered in the WIS 83 corridor study.		

Sources: *SEWRPC Park and Open Space Plan for Waukesha County*, Community Assistance Planning Report No. 137, *SEWRPC Development Plan for Waukesha County*, Community Assistance Planning Report No. 209, and information provided by the WisDNR, Town of Genesee, Village of Wales, and Ice Age Park & Trail Foundation.

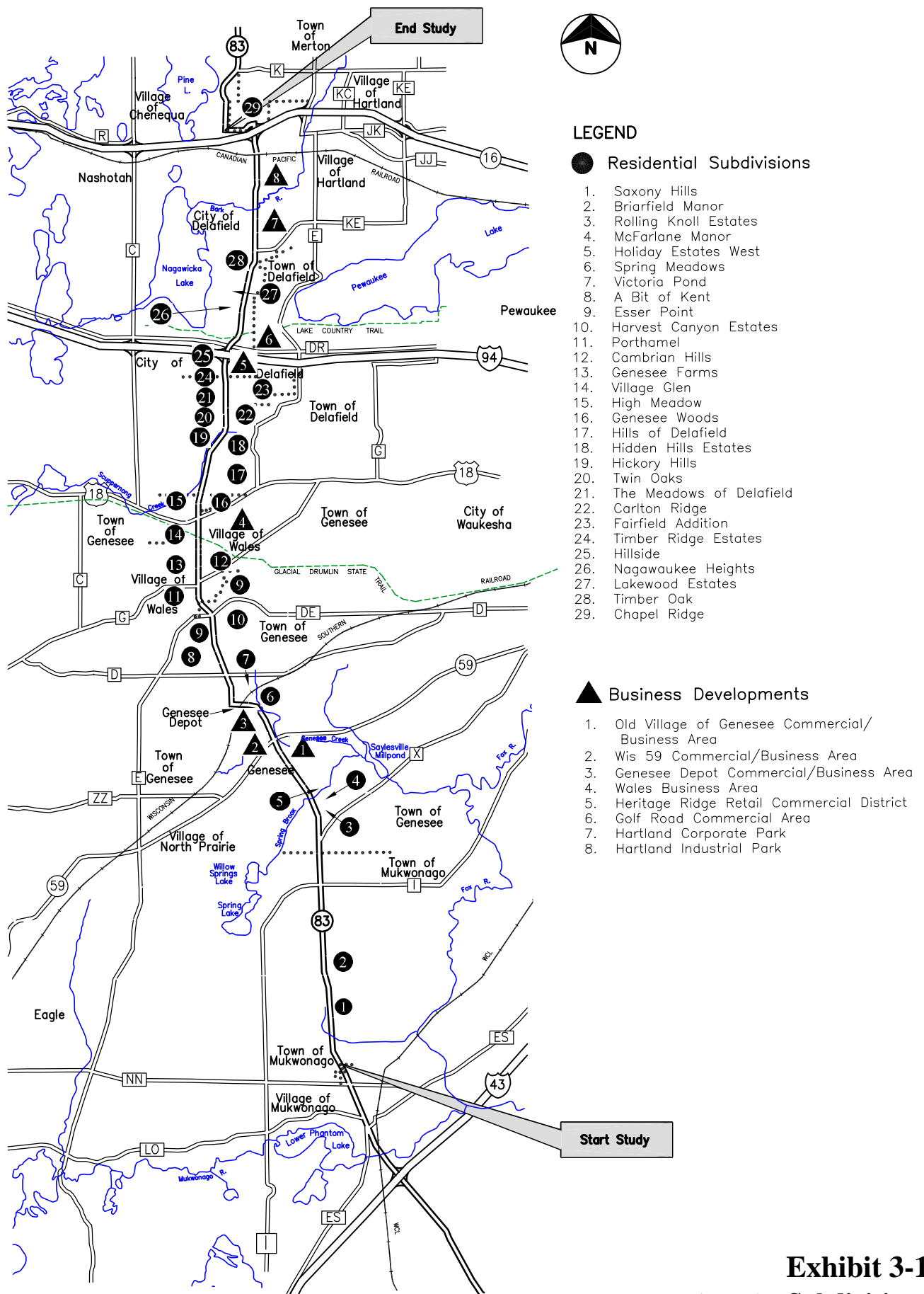
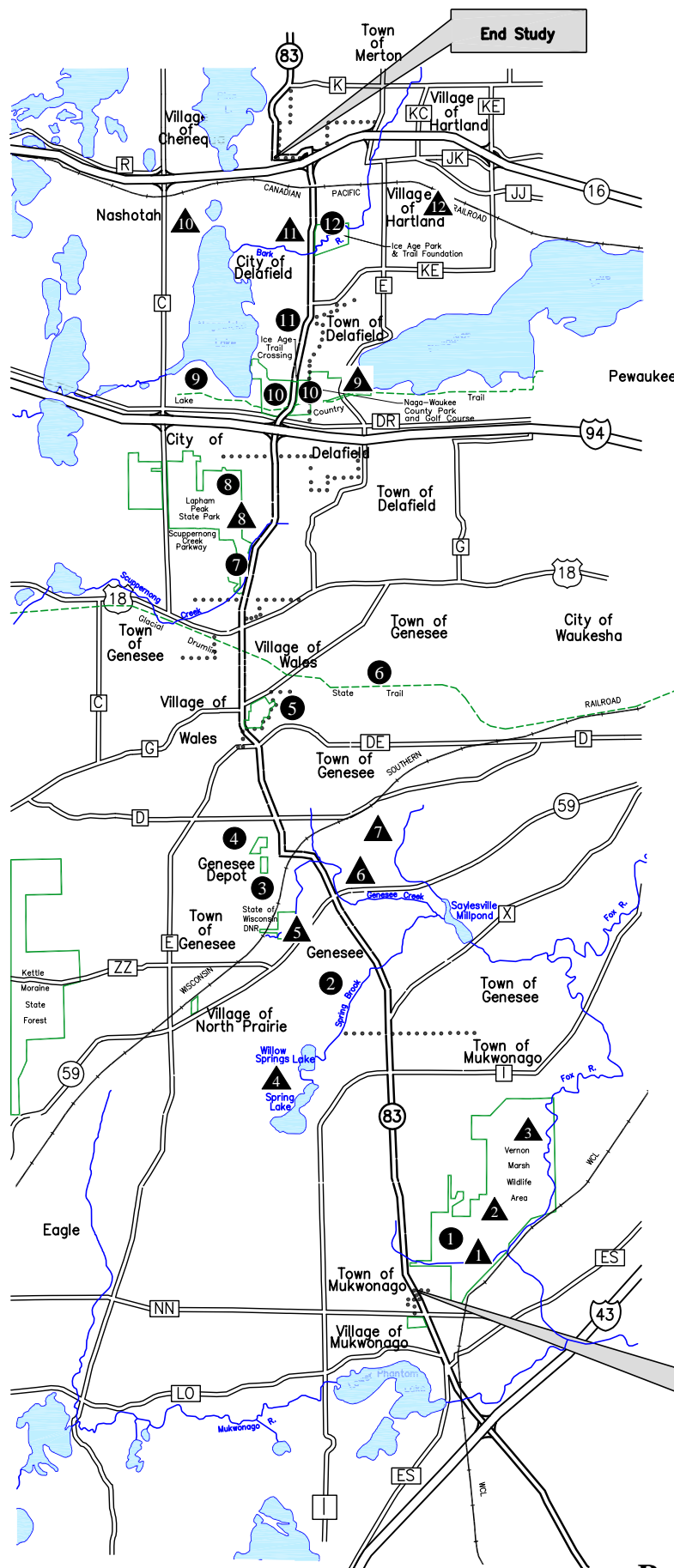


Exhibit 3-1
Residential Subdivisions
and Business Developments



LEGEND

● Recreation Resources / Public Use Lands

1. Vernon Marsh Wildlife Area
2. Spring Creek Parkway
3. Lunt-Fontanne Nature Center
4. Genesee Park
5. Wales Community Park
6. Glacial Drumlin State Trail
7. Scuppernon Creek Parkway
8. Lapham Peak State Park
9. Lake Country Trail
10. Naga-Waukee County Park & Golf Course
11. Ice Age Trail
12. Ice Age Park & Trail Foundation



▲ Natural Areas

1. Vernon Fen
2. Vernon Prairie-Fen
3. Vernon Tamarack-Fen
4. Spring Lake Sedge Meadow & Fens
5. Yatzeck's Fen State Natural Area
6. Carroll College Conservancy
7. CTH D Railroad Prairie
8. Lapham Peak Woods
9. Pewaukee Lake Access Fen
10. Nagawicka Lake Bog & Oak Woods
11. Bark River School Sedge Meadow
12. Hartland Railroad Prairie

Exhibit 3-3

Recreation Resources / Public Use Lands, and Natural Areas

Wetland	Location	Size	Description
Wetland Area W-1	East and west of WIS 83 at Fox River tributary	Unknown – to Vernon Marsh	The plant community area is part of the larger wetland complex along an unnamed tributary to the Vernon Marsh (Fox River) and consists of fresh (wet) meadow (M), second growth, Southern wet lowland hardwoods (WS), and Southern sedge meadow (M). Disturbances to the plant community area include agricultural land management activities including current grazing; dumping; filling; siltation and sedimentation due to storm water runoff from adjacent lands; and water level changes due to stream channel manipulation. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-2 ADID Wetland	West of WIS 83, south of Sudgen Road	10 ac (4 ha)	The plant community area is part of the larger wetland complex and consists of fresh (wet) meadow (M), shallow marsh (SM), and shrub-carr (SS). Disturbances to the plant community area include agricultural land management activities including past plowing; filling for farm access road; side casting of dredge spoil material; siltation and sedimentation due to storm water runoff from adjacent lands; and water level changes due to past ditching and draining. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-3	West of WIS 83, south of CTH I	7 ac (3 ha)	The plant community area is part of the larger wetland complex and consists of fresh (wet) meadow (M) and shallow marsh (SM). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; agricultural land management activities including plowing along the wetland edge; and mowing along the wetland edge. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-4 ADID Wetland	East and west of WIS 83 at Spring Brook	1000 ac (405 ha)	The plant community area is part of the Spring Brook floodplain-wetland complex and consists of shallow marsh (SM) and Southern sedge meadow (RPE). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; water level changes due to past ditching, draining, and stream channel realignment; and side-casting of dredge spoil material. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-5 ADID Wetland	East of WIS 83, north and south of WIS 59	6 ac (2 ha)	The plant community area is part of the Genesee Creek floodplain-wetland complex and consists of second growth, Southern wet to wet-mesic lowland hardwoods (WS), fresh (wet) meadow (M), shallow marsh (SM) and shrub-carr (SS). Disturbances to the plant community area include water level changes due to past ditching, draining, and stream channel realignment; siltation and sedimentation due to storm water runoff from adjacent lands; mowing at the wetland edge; and past filling and grading. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-6 ADID Wetland	East of WIS 83, north of WIS 59	40 ac (16 ha)	The plant community area is part of the Genesee Creek floodplain-wetland complex and consists of second growth, Southern wet to wet-mesic lowland hardwoods classified as wooded swamp (WS). Disturbances to the plant community area include selective cutting of trees; water level changes due to past ditching, and stream channel realignment; past filling and grading; and siltation and sedimentation due to storm water runoff from adjacent lands. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.

Wetland	Location	Size	Description
Wetland Area W-7 ADID Wetland	West and south of WIS 83 where Genesee Creek west branch crosses Off- Alignment Alternative D	200 ac (81 ha)	The plant community area is part of the Genesee Creek floodplain and consists of open water, shallow marsh (SM), shrub-carr, and Southern sedge meadow (M). Disturbances to the plant community area include water level changes due to impoundment structures, mowing, siltation and sedimentation due to storm water runoff from adjacent lands, and excavation and side-casting of dredge spoil material during pond construction. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-8 ADID Wetland	East and west of WIS 83 at Genesee Creek west branch in Genesee Depot	25 ac (10 ha)	The plant community area is part of the Genesee Creek floodplain-wetland complex and consists of shallow marsh (SM), sedge-fen classified as wet meadow (M), and shrub-carr classified as shrub-scrub (SS). Disturbances to the plant community area include side casting of dredge spoil material; water level changes due to past ditching, draining, and stream channel realignment; mowing at the wetlands edge; past filling and grading; and siltation and sedimentation due to storm water runoff from adjacent lands. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-9	East of WIS 83 north of US 18, and south of US 18 east of WIS 83	2 ac (1 ha)	The plant community area consists of an ephemeral pond with second growth, Southern wet lowland hardwoods classified as wooded swamp (WS). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-10 ADID Wetland	East and west of WIS 83, generally between Twin Oaks Drive and Glacier Pass	100 ac (40 ha)	The plant community is part of the Scuppernong Creek floodplain-wetland complex and consists of fresh (wet) meadow (WM), shallow marsh (SM), Southern sedge meadow (M), and shrub-carr classified as shrub-scrub (SS). Disturbances to the plant community area include water level changes due to past ditching, draining, and stream channel realignment; side-casting of dredge spoil material; past agricultural land management activities including plowing; past filling and grading; mowing at the wetlands edge; and siltation and sedimentation due to storm water runoff from adjacent lands. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-11	West of WIS 83, south of the Nagawaukee County Park entrance	0.2 ac (0.1 ha)	The plant community area consists of shallow marsh (SM). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; past filling and grading; and mowing at the wetland edge. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.
Wetland Area W-12	East of WIS 83, adjacent to Westbrook Church	2 ac (1 ha)	The plant community area consists of open water and shallow marsh (SM). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; past excavation and side casting of dredge spoils material; and mowing at the wetland edge. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.

Wetland	Location	Size	Description
Wetland Area W-13 ADID Wetland	West of WIS 83, north and south of the Bark River	30 ac (12 ha)	The plant community area is part of the Bark River floodplain-wetland complex and consists of fresh (wet) meadow (M), shrub-carr (SS) and Southern sedge meadow (M). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; past filling during highway construction; agricultural land management activities including plowing along the wetland edge; mowing and dumping along the wetland edge; and water level changes due to past ditching. While no Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection, the Bark River is known to provide habitat for Slender madtom (<u>Noturus Exilis</u>), a State-designated Endangered fish species; Pugnose shiner (<u>Notropis anogenus</u>), a State-designated Threatened fish species; Blanding's turtle (<u>Emydoidea blandingii</u>), a State-designated Threatened species; and Lake chubsucker (<u>Erimyzon sucetta</u>), a State-designated Special Concern fish species.
Wetland Area W-14 ADID Wetland	East of WIS 83, along the Bark River	120 ac (49 ha)	The plant community area is part of the Bark River floodplain-wetland complex and consists of shallow marsh (SM), shrub-carr (SS) and Southern sedge meadow (M). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; past filling during highway construction and sewer construction; excavation and side casting of dredge spoil material during detention pond construction; mowing at the wetland edge; and water level changes due to past ditching. While no Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection, the Bark River is known to provide habitat for Slender madtom (<u>Noturus Exilis</u>), a State-designated Endangered fish species; Pugnose shiner (<u>Notropis anogenus</u>), a State-designated Threatened fish species; and Lake chubsucker (<u>Erimyzon sucetta</u>), a State-designated Special Concern fish species.
Wetland Area W-15 ADID Wetland	West of WIS 83, north of the Bark River	15 ac (6 ha)	The plant community area is part of the Bark River floodplain-wetland complex and consists of shallow marsh (SM) and shrub-carr (SS). Disturbances to the plant community area include siltation and sedimentation due to storm water runoff from adjacent lands; past filling during highway construction; mowing and dumping at the wetland edge; and water level changes due to past ditching. No Federal- or State-designated Special Concern, Threatened, or Endangered species were observed during the field inspection.